Brackish Groundwater National Desalination Research Facility

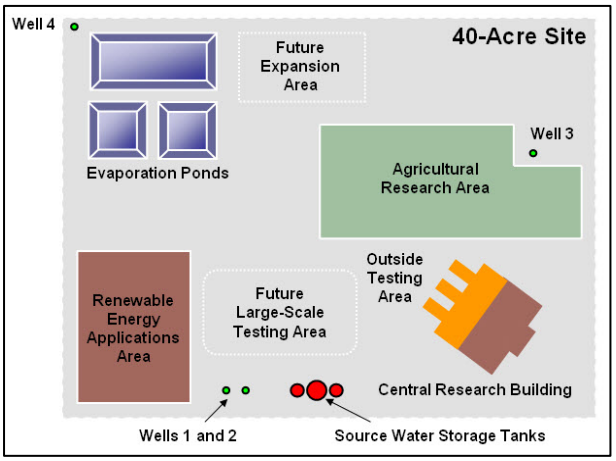
500 La Velle Road, Alamogordo, New Mexico

Introduction

The Brackish Groundwater National Desalination Research Facility (BGNDRF) is a federal facility that operates under the United States Department of Interior, Bureau of Reclamation (Reclamation). Established by act of congress, the facility mission is to promote sustainable advanced water treatment research and technology development for inland brackish groundwater sources. The Alamogordo area was chosen as the optimal site based on the wide range of brackish water sources, clear skies for solar powered applications, and a plentiful wind resource.

Mission

The mission of BGNDRF is to conduct research for the development of cost-effective, robust desalination and alternative energy technologies that produce sustainable new supplies of water and power for municipal, industrial, agricultural, and environmental purposes. The facility will serve as a proving ground and center for public education on water and energy.



Facility Diagram

The Facility

The facility includes a Central Research Building located on a 40-acre site. The office space includes a conference room for 30 people, four offices for researchers, water analysis laboratory and a monitoring room associated with indoor test bays.

Testing areas include 6 indoor test bays (13'x40') and 3 outside test pads (20'x 60'). The test bays and test pads are each equipped with dedicated power (120, 240, 480 V), data ports, source water, and service water. The indoor test bays are equipped with instrument air. Source water test flows of 30 gpm (113 L/min) are available at each test bay and 60 gpm (227 L/min) for each test pad. One large-scale outdoor testing area (80'x100', 24.4m x30.5m) is a gravel pad with a source water test flow capability of up to 100 kgal/day (375 m3/day). Other features of the test facility are depicted on the Facility Diagram.

Source water and storage:

- Low TDS well (1,000 – 1,200 mg/L) at 40 ºC from the well, a cooling tower is available
- Mid TDS wells (3,450 – 6,400 mg/L) at 21 ºC
- High TDS (≥10,000 mg/L) can be imported to the site
- Desalted well water available to prepare custom water chemistries
- Storage capacity: 1 tank @ 100 kgal; 2 tanks @ 50 kgal; all tanks have 3 fill connections – 1 for Low TDS with or without cooling tower, 1 shared for all Mid TDS sources, and 1 connection for trucked-in water.

Services and Supplies

Researchers may bring their own test equipment, supplies, and personnel for testing and monitoring services. BGNDRF staff will perform power and water supply connections. BGNDRF is available upon request for testing 24 hours per day, 7 days per week. There is no limit on duration of testing; however inactive equipment must be moved outside upon request.

Additional services from Reclamation Water Treatment Research and Engineering Team are available for a fee. The team consists of scientists, chemical and environmental engineers with extensive experience in process development, design, construction and testing. Examples of services:

- Process equipment design and construction
- Test plan development and implementation
- Quality control, monitoring, data acquisition, and report preparation
- Process and equipment troubleshooting
- Environmental Technology Validation (ETV) Testing in conjunction with NSF International

Though most arrangements are possible, there are four general levels of testing service available:

1) Client has a fully developed process and equipment and desires to verify performance. The Client supplies technical staff to monitor and operate the system. In this case BGNDRF staff will connect equipment to water and power, maintain water supply, and assist with minor adjustments when requested. Client pays space rental fee, water and power usage fees, and staff time for technicians. Client owns all intellectual property.
2) Client has fully developed process and equipment but needs assistance in verifying performance. Client can hire Reclamation staff to develop a test plan, perform testing, analyze data, and/or report on results. Client pays for space rental, staff time, and water and power usage charges. Client owns the intellectual property generated by the testing.
3) Client has fully developed process and equipment and wants an Environmental Technology Validation Test performed with NSF International and EPA oversight, which if successful would certify the claim made for the equipment. Client supplies equipment and claim to be certified. Reclamation works with NSF International and EPA to develop an approved test plan, and serves as the Testing Organization in the ETV process. Client pays space rental, water and power usage charges, staff time, and NSF International fees for oversight. Reclamation prepares the test report for NSF International for review and determination of success.
4) Client has an idea for a process and/or a prototype apparatus. BGNDRF and Reclamation staff can work with the client to design and build a system to test the hypothesis, develop test plan, perform testing, data analysis, quality control, and report on results. In this case the client may want to apply for a research grant in conjunction with a Reclamation scientist or engineer who would apply for internal research funding to help fund the project. Client and Reclamation share expenses and intellectual property.

Disclosure and Confidentiality

Disclosure and confidentiality of data are at the discretion of the clients of the facility.

Fees

The current fee schedule is below. Staff time cost is set by the Bureau of Reclamation. It covers salary, benefits, and overhead. Space rental is negotiable. Power and water are metered at each test bay. ETV Testing is coordinated with NSF International. Fees for NSF oversight are approximately $100,000 to cover test plan review, audit of test procedures, review of data and report by NSF and the Environmental Protection Agency (EPA), and publication of the report. Reclamation is a certified official ETV Testing Organization. Reclamation's staff time for test plan preparation, implementation, and reporting, and laboratory analysis fees are in addition to NSF charges.

2011 Fee Schedule (subject to change)	**Price**	**Unit**
Level 3 Engineer/Scientist	1064	$/Staff Day
Level 2 Engineer/Scientist	880	$/ Staff Day
Level 1 Technicians	664	$/ Staff Day
Interior Bay Rental	250	$/week
Exterior Bay Rental	400	$/week
Power	0.15	$/kWhr
Water RO Permeate ($2000 set up fee) +	10	$/kgal
On-site groundwater	2	$/kgal
Imported (Depends on source)		TBD
ETV Testing Coordination with NSF International	~$100,000	Per report

Water quality analysis available for staff time charge: conductivity, pH, ORP, Temperature, Colorimetric analyses, Particle counts, Turbidity, Silt Density Index

Candidates for Research

Candidates for research at BGNDRF include anyone interested in testing technologies with the capability of reducing the costs of inland desalination and concentrate disposal and reuse. The Candidates must be prepared to fund their research at BGNDRF for a fee. For current fee schedule, contact Randy Shaw, Facility Manager at (575) 443-6553 (RShaw@usbr.gov).

Getting Started

Potential candidates are invited begin with a tour of BGNDRF. Contact Randy Shaw, Facility Manager to schedule a tour. The next step is to work with Yuliana Porras-Mendoza, at (303) 445-2265 (YPorras@usbr.gov) and Randy Shaw in developing a facility use agreement.

Location and Lodging

BGNDRF is approximately 1.5 hours north of El Paso International Airport (ELP) and 3.5 hours south of Albuquerque International Sunport (ABQ). Recommended lodging within one mile of the Facility are the Holiday Inn Express, Hampton Inn, Comfort Inn and Suites, and Best Western Desert Air Hotel. For maps and more information on the area see the Chamber of Commerce website: http://www.alamogordo.com/tourism.htm.